

THURSDAY, AUGUST 11, 1904.

NATURAL HISTORY OF THE MALDIVES
AND LACCADIVES.*The Fauna and Geography of the Maldivé and Laccadive Archipelagoes.* Edited by J. S. Gardiner.

Vol. i., parts ii. to iv.; vol. ii., parts i. to iii. (Cambridge: C. J. Clay and Sons, 1902-4.)

AS the general scope and character of this important work were referred to at some length in a notice of the first part which appeared in NATURE for April 3, 1902 (vol. lxxv. p. 514), it will suffice on the present occasion to confine attention to some of the more generally interesting of the numerous memoirs contained in the parts now before us. By generally interesting, we mean reports which deal more especially with questions connected with morphology, development, the limitations of species, reef-formation, &c., rather than those devoted to systematic zoology, and it is on these grounds that we pass over papers like those by Messrs. Borradaile and Lanchester on crustaceans, and the one by Mr. E. Smith on molluscs (important as they are from their special point of view) in favour of some of those of the former type.

Special interest concentrates, of course, on the chapters (vol. i., parts ii. and iv.) devoted by the editor to the origin and mode of formation of the two archipelagoes under survey. In the chapters included in part ii., Mr. Gardiner, when stating his general views on this part of the subject, definitely and unhesitatingly rejects the theory that the two archipelagoes can have been formed by the subsidence of a large central island, the topography of the central deep plateau being, in his opinion, unfavourable to such a view. On the contrary, he maintains the former existence of continuous land over the area, which was planed down by the action of currents to an almost flat plateau at a depth of about 160 fathoms, and that on this plateau the different banks originated independently by the slow growth of deep-sea corals, assisted in some small degree by nullipores, &c., but completed by the subsequent growth of a superficial reef formed by true corals and nullipores, aided by a general outward extension of the growing reef by current-borne detritus. When the superficial reef approached the surface, it is considered probable that some land was formed by elevation, or by a change in the level of the ocean. Finally, in the individual atolls the lagoon was formed partially by the more rapid growth of the organisms on the edge of the bank, thereby building up an encircling reef, and partially by the subsequent erosion of the central area. The author adduces evidence to show that certain kinds of coral will grow freely at depths of considerably more than 200 fathoms, and he adds that his views with regard to reef and atoll formation hold good for the islands of the Pacific as well as for those of the Laccadive and Maldivé Archipelagoes. In the chapter in part iv. details are given of the various atolls, with remarks on apparent recent changes in the archipelagoes and on the death of corals.

Passing on to the purely zoological reports, we may notice that in dealing with the Chætogonatha (Sagittæ and its allies), Mr. Doncaster comments on the unstable character of the species in this group, several of which seem to graduate into others. Most remarkable is the fact that such species do not appear to be separated either geographically or in habit, closely allied forms living in the same locality under similar conditions. Consequently, it is difficult to believe that they can have been differentiated by natural selection. In his notice of the echinoderms, Prof. F. J. Bell corroborates previous observations as to the loss of the upper surface of the disc in many feather-stars (ophiurids), and further points out that if gonads are set free by the loss of this disc, and a new disc and new gonads are subsequently formed, the question of germ-plasm may be regarded as answered.

Another group which has yielded results of special interest is that of the alcyonarian polyps, the collection made by Mr. Gardiner's expedition serving to show, according to Prof. Hickson, the untrustworthy character of species formed on the evidence of single specimens. The large series of examples now for the first time available demonstrates the variation in form, colour, and other features of what appears to be one and the same specific type when collected over a large area. If, for instance, a specimen of organ-pipe coral (*Tubipora*) were collected in Celebes and a second in the Maldives, there is little doubt that they would be regarded as representing two distinct species, but a walk at low tide along a Maldivé reef would reveal the existence of a number of intermediate types connecting the two supposed species by imperceptible gradations. These organisms, in fact, exhibit a number of "facies," which have not local limitations.

"If each facies," observes Prof. Hickson, "represents a species, then we have the remarkable phenomenon of a number of closely related species distributed over a wide area and competing in the struggle for existence, with approximately equal success, in many localities of this area. If, on the other hand, all the facies represent but one species, then we have a species capable of extraordinary variation in circumstances apparently identical."

Without recourse to cross-breeding, it is impossible to demonstrate which of the two propositions is true, and the only practical course is therefore to regard as species all the unconnected types.

The species question is resumed in the chapters on madreporiform corals (vol. ii. part iii.), where Mr. Gardiner remarks that he has found much less difficulty in finding the limitations of species among the *Astreidæ* than was experienced by Mr. Bernard in the case of the perforate group. The puzzle will, he thinks, in both cases be solved by definitely ascertaining which variations are discontinuous and which continuous. Here occasion is taken to notice the favourable conditions presented by corals for the study of variation, owing to the fact that the larvæ have no choice in their environment. Unless there be real action on the part of the local environment in producing discontinuous variation in the gametes of new immigrants, it will be obvious that the species must remain approximately constant.

Another report demanding special notice is the one by Mr. R. C. Punnett on the Enteropneusta, the collection brought together by Mr. Gardiner being the most extensive hitherto made in any one locality. This richness has enabled Mr. Punnett to attempt the study of the variation (that is to say, the development of local forms) displayed by certain members of the group, this having never been previously practicable. In addition to the description of new species of Ptychodera and Balanoglossus, the author takes the opportunity of describing a new generic type from Zanzibar, for which the name *Willeyia bisulcata* is proposed, characterised by its large size and the great length of the proboscis and collar. After discussing many debatable structural features connected with these curious organisms, Mr. Punnett takes occasion to express his opinion of the importance of Willey's theory as to the origin of gill-clefts, which he believes to obtain further support from the evidence of this group. To recapitulate the author's views in detail would occupy too much space, and it can only be mentioned that the gonads are suggested as being the prime factors in the segmentation of the Chordata, each gonad having ultimately acquired an independent aperture of escape from the body, which became subsequently used for respiration, and thus a gill-cleft.

If we pass over the accounts of the Chordata by Messrs. Cooper and Punnett, it is only from lack of that space necessary to do anything like justice to one of the most important biological and physiological works of our time. To conclude without expressing our opinion as to the business-like manner and thoroughness with which both the expedition itself and the examination and description of the specimens and the codifying of the general results have been carried out (so far as they are yet published) would, however, be alike ungracious and unappreciative.

R. L.

JOHN PARKINSON'S "PARADISUS."

Paradisi in Sole Paradisus terrestris. By John Parkinson. Faithfully reprinted from the edition of 1629. Pp. 1+612. (London: Methuen and Co., 1904.) Price 2l. 2s. net.

THIS is a handsome reprint of a notable book, which, even in its original form, never made so brave a show as does this facsimile, with its fine type, excellent paper, rough edges, and grey paper boards. The page illustrations suffer somewhat in sharpness, owing to the process by which they have been reproduced, in comparison with the cuts in the older editions, which were worked from the blocks themselves. It is a genuine reprint; with the exception of a half-title and the title-page set out above, the old herbalist's book is left to tell its own tale. We are glad to be spared the modern editor's introduction, which in this instance would have been an infliction.

John Parkinson, King's Herbalist, was born in 1567, and with John Gerard occupies a special position in our literature as one of our herbalists. Gerard's "Herball" was based upon Continental work, and very few cuts were due to him; Parkinson's books

were his own, woodcuts and text alike. Gerard's "Herball" was edited and much improved by Thomas Johnson in 1633, and was reprinted in 1636; Parkinson's "Paradisus," which came out in 1629, when the author had passed his sixtieth birthday, was reprinted in 1656, six years after his death, practically unaltered. He regarded the "Paradisus" as constituting three parts of a comprehensive treatise on plants—the garden of pleasant flowers, the kitchen garden, and the orchard. Eleven years later, the fourth part, his "Theatrum," appeared, devoted chiefly to medical plants, but in bulk much exceeding his previous publication.

We have before us copies of all the issues; the original issue of 1629, with its thin, foxed paper and striking woodcuts, and its reprints. Parenthetically it may be remarked that these blocks, measuring ten inches by six, do not appear to be built up, as box-wood blocks, but were cut along the grain, and consisted of pear-wood. The actual blocks are not extant, but judging from woodcuts of the same century we are justified in assuming that Parkinson's illustrations were produced as we have said. The old authors were economical of their blocks; Dodoens, Clusius, and their contemporaries were apt to square off their plants to fit the block, or to twist the plant to come within the limits available. Here we find many specimens displayed on the same block, sometimes ingeniously arranged in a give-and-take manner. No book gives a better idea of the gardens of the time, with their plans and plants, than the volume before us; the author starts with general principles of laying out or "ordering" his garden, and then goes on to describe what should grow in it—hardy flowers nearly all, but the variety of tulips, iris, narcissus, and similar plants strikes a modern reader. Many little touches of human personality shine through the accounts given; old colleagues and benefactors by whom certain bulbs or seeds were introduced are mentioned; some of those named may be found in the works of other authors, and we greet them as old friends; some of them appear in connection with their favourite flowers, as "John Tradescant his great Rose Daffodill," or "Mr. Wilmer's great double Daffodill." It is largely due to the revived love for hardy garden flowers, especially the narcissus, that Parkinson's book has of recent years become almost impossible to get, the price having risen from shillings to nearly as many pounds within one generation.

The second issue varied from the first by having a printed title-page in front of the engraved one, and although it boasted of being "much Corrected and Enlarged," many of the printer's errors noted in the first were not corrected in the second edition; the pages are not precisely the same, nor are the tables at the end, and the only noticeable enlargement is the letter-press title-page just mentioned.

The third issue is that now under review, but the publishers seem to have failed to notice the pun in the title, which at length runs thus:—

"Paradisi in Sole Paradisus Terrestris. Or a Garden of all sorts of pleasant flowers which our English ayre will permitt to be noursed upp: with A